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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN F. KENNEDY SPACE CENTER
KENNEDY SPACE CENTER, FLORIDA 32899

REPLY TO
ATTN OF: AA-AVO-3(71-189)

AUG 11 1961

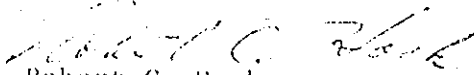
MEMORANDUM

TO: Distribution

FROM: AA/Manager, Apollo-Skylab Programs

SUBJECT: Apollo Program Directive #21A

A copy of Apollo Program Directive No. 21A, is being sent to you for information only. As stated in the attached briefing note (enclosure #2), this APD does not impact KSC.


Robert C. Hock

Enclosures

1. APD #21A
2. Briefing Note
to CD

Distribution:
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751090 3-3

Dr. Debus

AUG 9 1971

SUBJECT: APD #21A, "Weight and Performance Data Submittal Requirements"

Apollo Program Directive No. 21A, "Weight and Performance Data Submittal Requirements," dated July 21, 1971, replaces APD #21, same title, dated August 15, 1966. The major changes in APD #21 are the addition of weight reporting requirements for the Lunar Roving Vehicle, the deletion of reporting requirements for the Saturn IB vehicle, and some reorganization of the material within the APD. All of the reporting action is the responsibility of the Manned Spacecraft Center or the Marshall Space Flight Center. This directive has no impact on KSC.

Copies of the directive will be sent to all KSC Directorates for information only.



Robert C. Hock
Manager, Apollo-Skylab Programs

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APOLLO PROGRAM DIRECTIVE NO. 21A

TO : DISTRIBUTION

FROM:

Rocco A. Patrone
DIRECTOR, APOLLO PROGRAM

SUBJECT: Weight and Performance Data
Submittal Requirements

REFERENCES: (a) M-D-MA 500-11/SE010-000-1 Apollo Flight
Mission Assignments
(b) SE 005-001-1 Revision C Apollo Program
Specification J-Missions

I. PURPOSE

This directive defines the procedures to be used for reporting the weight and performance of the Saturn V launch vehicle, the Apollo spacecraft, and the Lunar Roving Vehicle. This directive cancels and supersedes Apollo Program Directive No. 21 SE015-008-1A, "Monthly Weight and Performance Data Submittal Requirements," dated August 15, 1966.

II. SCOPE

A primary tool for controlling space vehicle weight is a timely and consistent weight and performance reporting system. This directive concerns only a portion of the overall reporting system. The procedures defined herein shall be used for weight and performance reporting to the Apollo Program Office of the Saturn V launch vehicles and the Lunar Roving Vehicle by the Marshall Space Flight Center and the Apollo spacecraft by the Manned Spacecraft Center. The establishment of appropriate procedures to ensure adequate contractor reporting and weight control of the flight hardware is the responsibility of the appropriate Center and shall be covered by level 2 documentation.

III. DEFINITIONS

The definition of terms used in reporting Apollo-Saturn weights and performance shall be those specified in Reference (b).

IV. DATA REQUIREMENTS

The data defined below shall be submitted on a vehicle-by-vehicle basis, as applicable, (a) for each stage, each interstage and the instrument unit of the Saturn V launch vehicles, (b) for each LRV, and (c) for each module, the adapter, and the LES for each Apollo Spacecraft, loaded for the appropriate mission as specified in the Apollo Flight Mission Assignments document.

1. Performance data including mixture ratio, specific impulse, thrust, and delta velocity.
2. Total weight and stage weight for each stage or spacecraft module.
3. Payload weight for each LM, CSM, and LRV.
4. Payload capability for each launch vehicle.
5. Propellant weight, including a breakdown showing allocations for reserves, contingencies, etc.
6. Limit weight for each applicable spacecraft module.
7. Changes in both weight and performance occurring since the previous report, and pending changes. The magnitude of each change shall be given, along with a complete description of the reason for the change. Changes in spacecraft limit weights shall be reported in the same manner.
8. Weight and performance history during the mission tabulated with respect to time or profile events.

V. PROCEDURES

The data shall be submitted to the Apollo Program Office, Systems Engineering, Code MAS. The spacecraft and LRV data shall be provided at least monthly by the transmitting organization and shall be the most current values available. The Saturn V launch vehicle data shall be provided whenever any significant changes occur.

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The reports on each vehicle shall continue until launch of the vehicle and the final report shall include the data at launch to the same detail as the prior reports.

The format shall be as mutually agreed upon between the Apollo Program Office and the reporting organization. Any changes to the established format shall be coordinated with the Apollo Program Office, Code MAS.

VI. RESPONSIBILITIES

The Saturn Program Manager shall be responsible for reporting the Saturn V launch vehicle and the LRV weights and performance. The Apollo Spacecraft Program Manager shall be responsible for reporting the Apollo spacecraft weights and performance.